

Consolidation of Grade 6 EQAO Questions



Measurement

SE2 Families of Schools

GRADE SIX EQAO QUESTIONS: Measurement

Year	MV1	MV2
Spring 2006	MC32	MC1 MC2 MC18 MC21 MC22 MC33 OR11
Spring 2007	MC4 MC16	MC3 MC15 MC24 MC25 MC36 OR10
Spring 2008	MC19	MC3 MC4 MC20 MC21 MC33 MC34 OR8
Spring 2009	MC19 MC33	MC3 MC4 MC20 MC21 MC34 OR10
Spring 2010	MC 20	MC3 MC4 MC19 MC21 MC22 MC24 MC33 OR10

OVERALL EXPECTATIONS

MV1

- Estimate, measure, and record quantities, using the metric measurement system

MV2

- Determine the relationships among units and measurable attributes, including the area of a parallelogram, the area of a triangle, and the volume of a triangular prism

MEASUREMENT: Attributes, Units, and Measurement Sense

Grade 4	Grade 5	Grade 6
Overall Expectation #1		
- Estimate, measure, and record length, perimeter, area, mass, capacity, volume, and elapsed time, using a variety of strategies	- Estimate, measure, and record perimeter, area, temperature change, and elapsed time, using a variety of strategies	- Estimate, measure, and record quantities, using the metric measurement system
Specific Expectations		
- Estimate, measure, and record length, height, and distance, using standard units (i.e., millimetre, centimetre, metre, kilometre)		- Demonstrate an understanding of the relationship between estimated and precise measurements, and determine and justify when each kind is appropriate
- Draw items using a ruler, given specific lengths in millimetres or centimetres		
- Estimate, measure (i.e., using an analogue clock), and represent time intervals to the nearest minute	- Estimate, measure (i.e., using an analogue clock), and represent time intervals to the nearest second	
- Estimate and determine elapsed time, with and without using a time line, given the durations of events expressed in five-minute intervals, hours, days, weeks, months, or years	- Estimate and determine elapsed time, with and without using a time line, given the durations of events expressed in minutes, hours, days, weeks, months, or years	
	- Measure and record temperatures to determine and represent temperature changes over time	
- Estimate, measure using a variety of tools and strategies, and record the perimeter and area of polygons	- Estimate and measure the perimeter and area of regular and irregular polygons, using a variety of tools	
- Estimate, measure, and record the mass of objects, using the standard units of the kilogram and the gram		- Estimate, measure, and record length, area, mass, capacity, and volume, using the metric measurement system
- Estimate, measure, and record the capacity of containers, using the standard units of the litre and the millilitre		
- Estimate, measure using concrete materials, and record volume, and relate volume to the space taken up by an object		

MEASUREMENT: Measurement Relationships

Grade 4	Grade 5	Grade 6
Overall Expectation #2		
- Determine the relationships among units and measurable attributes, including the area and perimeter of rectangles	- Determine the relationships among units and measurable attributes, including the area of a rectangle and the volume of a rectangular prism	- Determine the relationships among units and measurable attributes, including the area of a parallelogram, the area of a triangle, and the volume of a triangular prism
Specific Expectations		
- Describe, through investigation, the relationship between various units of length (i.e., millimetre, centimetre, decimetre, metre, kilometre)	- Select and justify the most appropriate standard unit (i.e., millimetre, centimetre, decimetre, metre, kilometre) to measure length, height, width, and distance, and to measure the perimeter of various polygons	- Select and justify the appropriate metric unit (i.e., millimetre, centimetre, decimetre, metre, decametre, kilometre) to measure length or distance in a given real-life situation
- Select and justify the most appropriate standard unit (i.e., millimetre, centimetre, decimetre, metre, kilometre) to measure the side lengths and perimeters of various polygons		
	- Solve problems requiring conversion from metres to centimetres and from kilometres to metres	- Solve problems requiring conversion from larger to smaller metric units
		- Determine, using concrete materials, the relationship between units used to measure area (i.e., square centimetre, square metre), and apply the relationship to solve problems that involve conversions from square metres to square centimetres
- Determine, through investigation, the relationship between the side lengths of a rectangle and its perimeter and area	- Determine, through investigation using a variety of tools and strategies, the relationships between the length and width of a rectangle and its area and perimeter, and generalize to develop the formulas [i.e., $Area = length \times width$; $Perimeter = (2 \times length) + (2 \times width)$];	- Determine, through investigation using a variety of tools and strategies, the relationship between the area of a rectangle and the areas of parallelograms and triangles, by decomposing and composing
		- Develop the formulas for the area of a parallelogram (i.e., $Area\ of\ parallelogram = base \times height$) and the area of a triangle [i.e., $Area\ of\ triangle = (base \times height) \div 2$], using the area relationships among rectangles, parallelograms, and triangles
- Pose and solve meaningful problems that require the ability to distinguish perimeter and area	- Solve problems requiring the estimation and calculation of perimeters and areas of rectangles	- Solve problems involving the estimation and calculation of the areas of triangles and the areas of parallelograms
- Compare and order a collection of objects, using standard units of mass (i.e., gram, kilogram) and/or capacity		

(i.e., millilitre, litre)		
- Determine, through investigation, the relationship between millilitres and litres		
- Determine, through investigation, the relationship between grams and kilograms	- Select and justify the most appropriate standard unit to measure mass (i.e., milligram, gram, kilogram, tonne)	
- Select and justify the most appropriate standard unit to measure mass (i.e., milligram, gram, kilogram) and the most appropriate standard unit to measure the capacity of a container (i.e., millilitre, litre)		
- Solve problems involving the relationship between years and decades, and between decades and centuries	- Solve problems involving the relationship between a 12-hour clock and a 24-hour clock	
- Compare, using a variety of tools, two-dimensional shapes that have the same perimeter or the same area	- Create, through investigation using a variety of tools and strategies, two-dimensional shapes with the same perimeter or the same area	- Construct a rectangle, a square, a triangle, and a parallelogram, using a variety of tools given the area and/or perimeter
	- Determine, through investigation using stacked congruent rectangular layers of concrete materials, the relationship between the height, the area of the base, and the volume of a rectangular prism, and generalize to develop the formula (i.e., $Volume = area\ of\ base \times height$)	determine, through investigation using a variety of tools and strategies the relationship between the height, the area of the base, and the volume of a triangular prism, and generalize to develop the formula (i.e., $Volume = area\ of\ base \times height$)
		- Determine, through investigation using a variety of tools and strategies, the surface area of rectangular and triangular prisms
	- Determine, through investigation, the relationship between capacity (i.e., the amount a container can hold) and volume (i.e., the amount of space taken up by an object), by comparing the volume of an object with the amount of liquid it can contain or displace	
		- Solve problems involving the estimation and calculation of the surface area and volume of triangular and rectangular prisms

GRADE SIX EQAO QUESTIONS: Measurement

Overall Expectation #1:

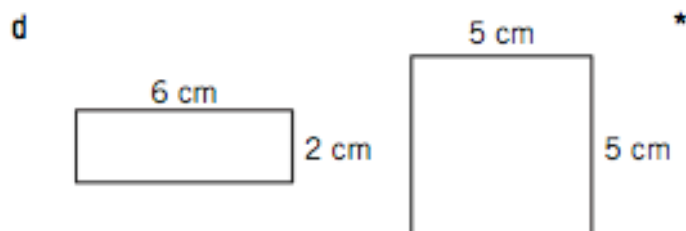
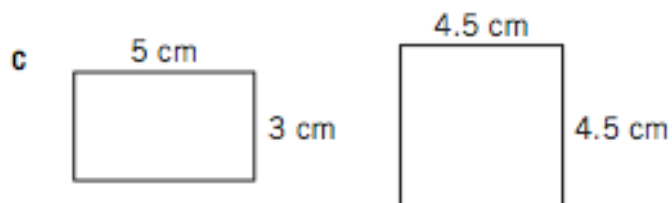
- Estimate, measure, and record quantities, using the metric measurement system

Spring 2006

32 Ms. Vanstone asks her students to draw a rectangle and a square with the areas and perimeters given below.

	Rectangle	Square
Area	12 cm^2	25 cm^2
Perimeter	16 cm	20 cm

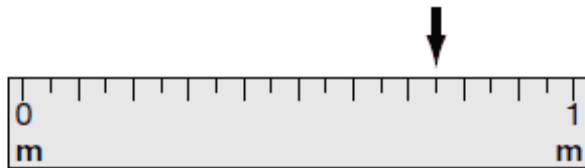
Which shows two correct drawings?



GRADE SIX EQAO QUESTIONS: Measurement

Spring 2007

- 4** Frank measures the width of a desk by using a metre stick. He marks a spot on the metre stick to indicate the width of the desk, as shown below.



Which is closest to the width of the desk?

- F 0.70 metres
- G 0.75 metres
- H 15 centimetres
- J 80 centimetres

- 16** Sometimes measurement can be estimated, and at other times it must be very accurate. A list of locations where running times might be measured is shown below.

1. Olympics
2. on the playground
3. school track meet

Which list shows the locations in order from the greatest to the least need for accuracy?

- F 3, 2, 1
- G 3, 1, 2
- H 1, 2, 3
- J 1, 3, 2

GRADE SIX EQAO QUESTIONS: Measurement

Spring 2008

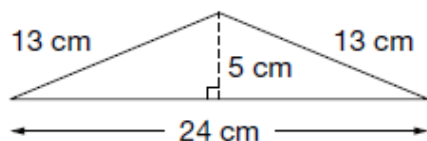
19 The time spent on which of the following activities would **best** be measured to the nearest hundredth of a second?

- a playing at recess
- b walking to school
- c working on homework
- d running a 50-metre race

GRADE SIX EQAO QUESTIONS: Measurement

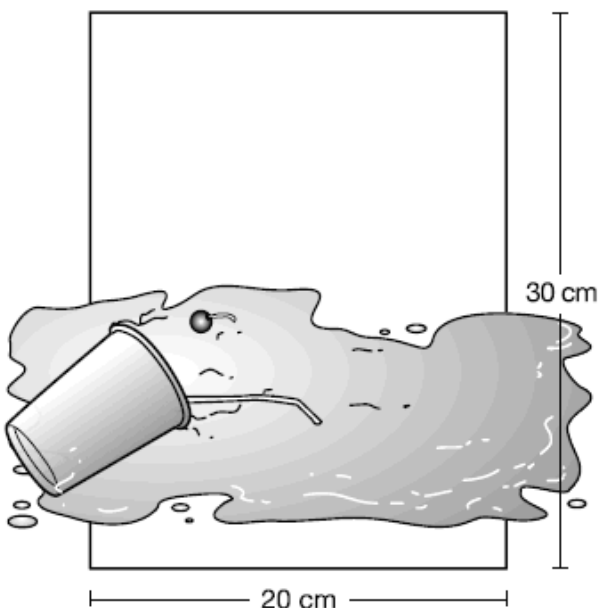
Spring 2009

19 What is the area of the triangle shown below?



- a 60 cm^2
- b 65 cm^2
- c 120 cm^2
- d 156 cm^2

33 Samantha spills a milkshake on a rectangular piece of paper as shown below.



Which of the following **best** approximates the area of the entire spill?

- a 100 cm^2
- b 300 cm^2
- c 400 cm^2
- d 600 cm^2

GRADE SIX EQAO QUESTIONS: Measurement

Overall Expectation #2:

- Determine the relationships among units and measurable attributes, including the area of a parallelogram, the area of a triangle, and the volume of a triangular prism

Spring 2006

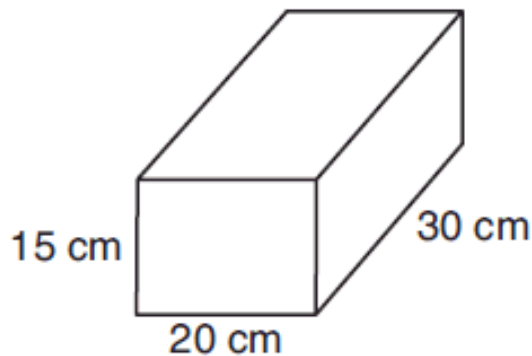
- 1** Which is the most appropriate unit of measurement to describe the area of the floor of a gym?

a km^2
b cm^3
c m^2 *
d m^3

- 2** Joseph has a measuring wheel that clicks once for every metre he walks. How many times will the wheel click when Joseph walks 2.6 km?

a 2
b 26
c 260
d 2600 *

- 18** Four students calculate the volume of the shoe box shown below.

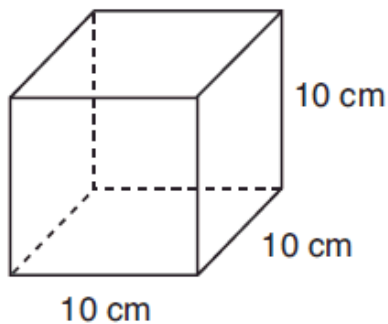


The following number sentences show the students' calculations. Which calculation is correct?

- a $15 \text{ cm} \times 20 \text{ cm} = 300 \text{ cm}^2$
b $20 \text{ cm} \times 30 \text{ cm} = 600 \text{ cm}^2$
c $20 \text{ cm} + 30 \text{ cm} + 15 \text{ cm} = 65 \text{ cm}^3$
d $15 \text{ cm} \times 20 \text{ cm} \times 30 \text{ cm} = 9000 \text{ cm}^3$ *

GRADE SIX EQAO QUESTIONS: Measurement

- 21** A cube is shown below. It is 10 cm wide, 10 cm long and 10 cm high.



What is the area of one of the faces of the cube?

- a 10 cm^2
- b 30 cm^2
- c 100 cm^2 *
- d 1000 cm^2

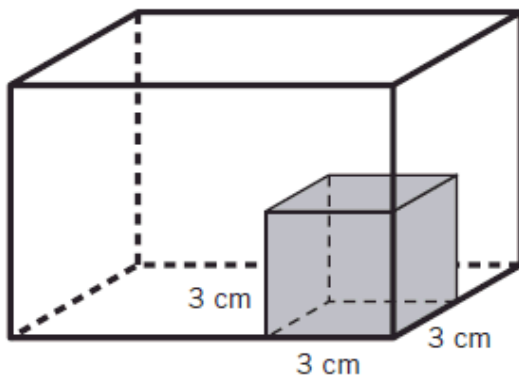
- 22** Sam buys 4 items in a store. The mass of each item is recorded below.

9000 mg, 400 g, 0.04 kg, 0.009 kg

Which item has the greatest mass?

- a 9000 mg
- b 400 g *
- c 0.04 kg
- d 0.009 kg

- 33** Twelve cubes measuring 3 cm by 3 cm by 3 cm fit perfectly into the rectangular prism shown below.

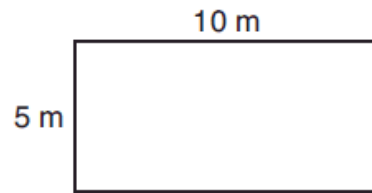


What is the volume of the rectangular prism in cm^3 ?

- a 36 cm^3
- b 162 cm^3
- c 288 cm^3
- d 324 cm^3 *

GRADE SIX EQAO QUESTIONS: Measurement

- 11** Susie wants to tile the floor of her family's rectangular play room. The tiles she plans to use are 10 cm by 10 cm squares. A drawing of the room is shown below.



How many of the square tiles will Susie need to cover the floor of the play room?

Show your work.

Susie will need _____ tiles.

GRADE SIX EQAO QUESTIONS: Measurement

Spring 2007

- 3** The dimensions of a rectangular prism are shown below.

- 5 cm wide
- 4 cm long
- 4 cm high

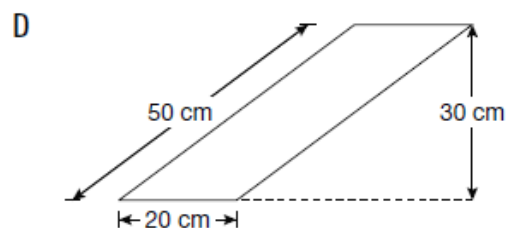
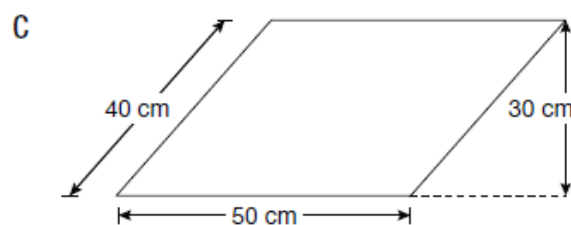
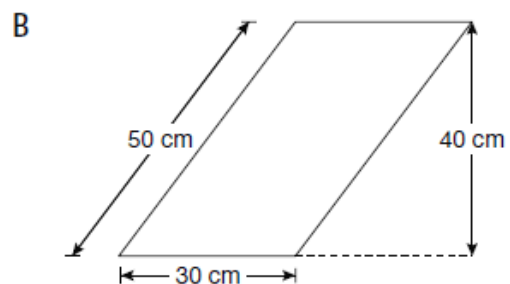
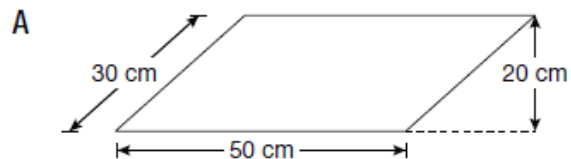
What is the total surface area of this rectangular prism?

- A 57 cm^2
- B 80 cm^2
- C 96 cm^2
- D 112 cm^2

- 15** An artist has some paintings that are rectangular and some that are parallelograms. One of her paintings is shaped like the rectangle shown below.



Which of the following parallelograms has the same area as the rectangle?



GRADE SIX EQAO QUESTIONS: Measurement

24 A box of modelling clay that weighs 3.5 kg is divided equally among 14 students. How many grams does each student receive?

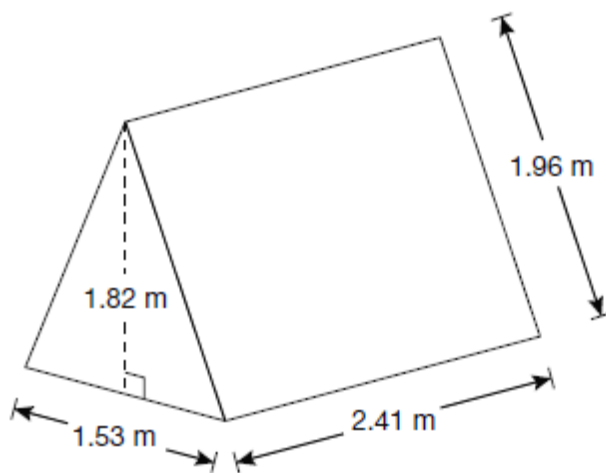
F 0.25 g

G 4 g

H 49 g

J 250 g

25 Cynthia purchases a tent for her camping trip, as shown below. During one night of the camping trip, it rains. The floor of the tent is the only part that stays dry.



What is the area of the part of Cynthia's tent that gets wet?

A 10.84 m^2

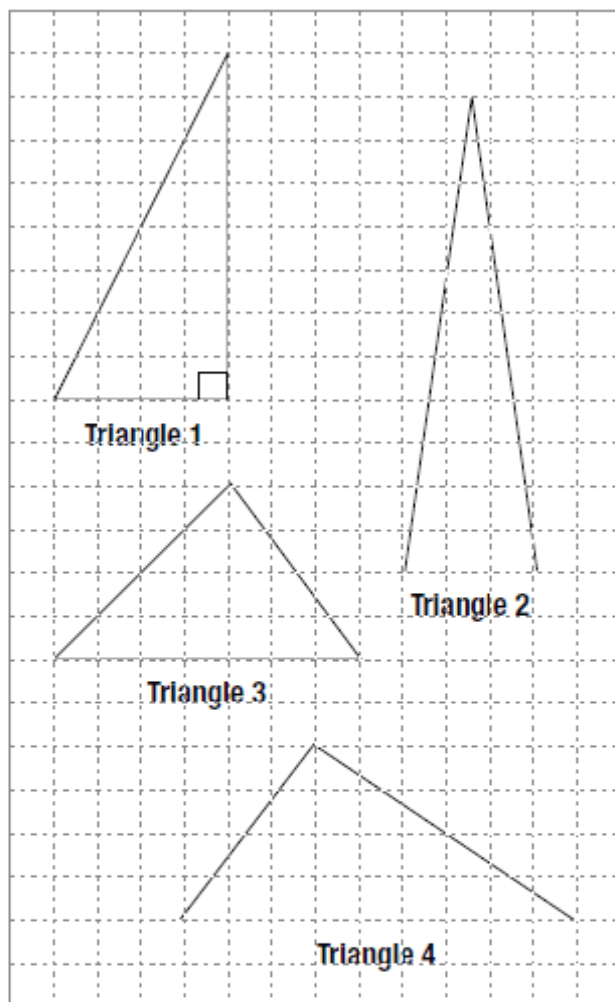
B 12.23 m^2

C 15.01 m^2

D 16.96 m^2

GRADE SIX EQAO QUESTIONS: Measurement

36 Four triangles are shown on the grid below.

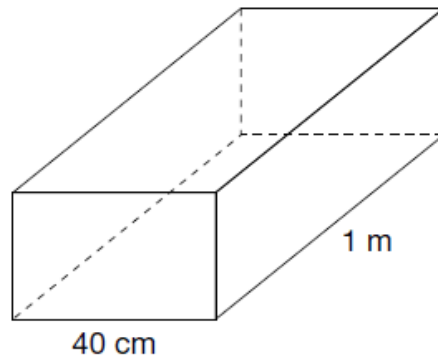


Which triangle has an area of 18 square units?

- F Triangle 1
- G Triangle 2
- H Triangle 3
- J Triangle 4

GRADE SIX EQAO QUESTIONS: Measurement

- 10** Jude's fish tank, shown below, holds $100\,000\text{ cm}^3$ of water when full. Jude decides to pour in water to a height of 5 cm below the top of the tank.



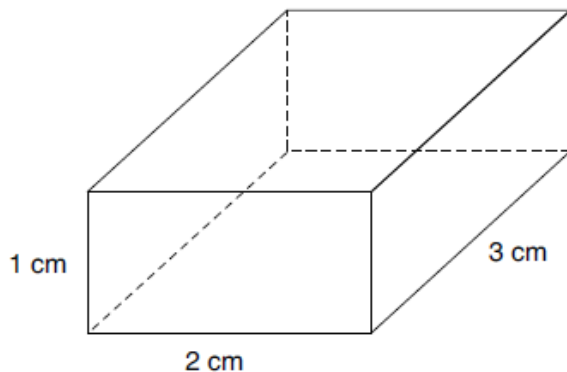
How much water, in cm^3 , will Jude need to pour into the tank so that the water is 5 cm below the top?

Show your work.

GRADE SIX EQAO QUESTIONS: Measurement

Spring 2008

- 3** What is the total surface area of the rectangular prism below?



- a 6 cm^2
- b 11 cm^2
- c 16 cm^2
- d 22 cm^2

- 4** What is the area of a parallelogram with a height of 2 m and a base of 3.5 m?

- a 1.75 m^2
- b 3.50 m^2
- c 7.0 m^2
- d 11.0 m^2

- 20** Mr. Clarke wants to tile a floor that is 6 metres long and 4 metres wide. The dimensions of each square tile are 20 cm by 20 cm. What is the minimum number of tiles that Mr. Clarke will need to tile the entire floor?

- a 24
- b 400
- c 600
- d 1200

GRADE SIX EQAO QUESTIONS: Measurement

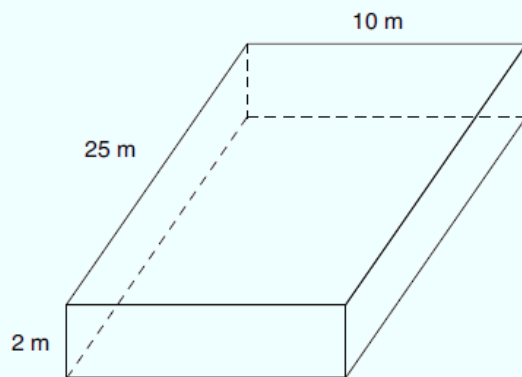
21 Which of the following would be the **most** appropriate metric unit to measure the length of Johann's arm?

- a decimetre
- b decametre
- c millimetre
- d kilometre

33 A group of 6 people equally shares 12 litres of juice. How many millilitres of juice does each person receive?

- a 2
- b 72
- c 2000
- d 12 000

34 A pool in the shape of a rectangular prism is shown below.



Hint :

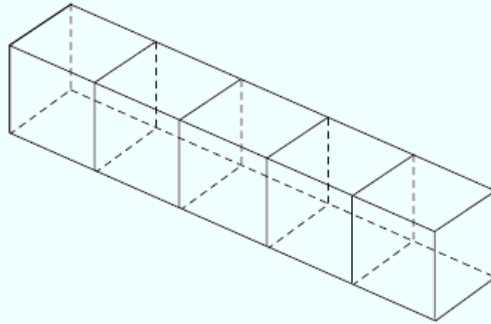
$$1 \text{ m}^3 = 1000 \text{ L}$$

How many litres of water are needed to completely fill the swimming pool?

- a 500 000
- b 50 000
- c 5000
- d 500

GRADE SIX EQAO QUESTIONS: Measurement

- 8** Daneen builds a model train with 5 cubes as shown below. The dimensions of each cube are $2\text{ cm} \times 2\text{ cm} \times 2\text{ cm}$.



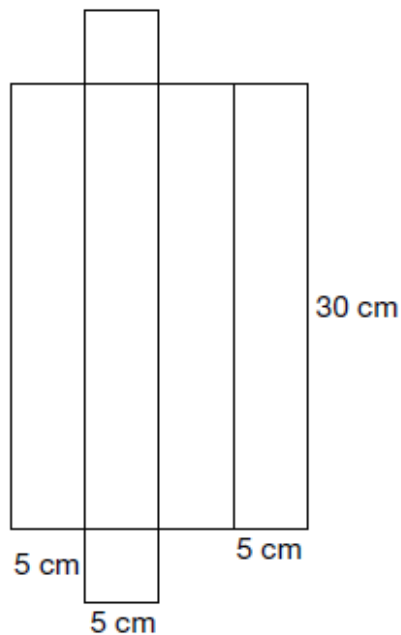
Daneen wants to paint the outside of the model train with red paint. The cost to paint 1 cm^2 of the train is \$0.75. How much will it cost to paint the outside of the model train?

Show your work.

GRADE SIX EQAO QUESTIONS: Measurement

Spring 2009

- 3** Rebecca creates a net of a rectangular prism, as shown below.



What is the total surface area of the rectangular prism?

- a 450 cm^2
- b 600 cm^2
- c 650 cm^2
- d 750 cm^2

- 4** Ravi makes 2.80 L of pudding. He wants to completely fill 350 mL cups with pudding. Which of the following expressions can be used to find how many 350 mL cups Ravi can fill?

- a $2.80 \times 1000 \div 350$
- b $2.80 \times 1000 + 350$
- c $2.80 \times 350 \times 1000$
- d $2.80 \times 350 \div 1000$

GRADE SIX EQAO QUESTIONS: Measurement

- 20** Elda has a rectangular piece of paper with an area of 0.12 m^2 . She cuts this piece of paper into small rectangles each with an area of 200 cm^2 .

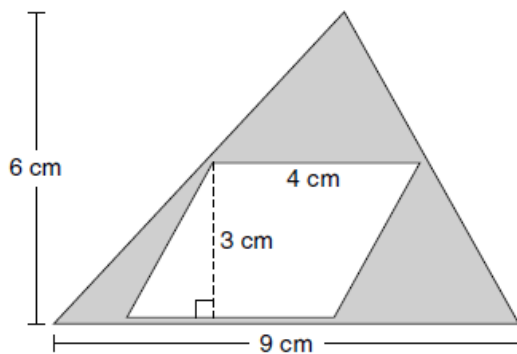
What is the maximum number of these small rectangles that Elda can cut?

- a 6
- b 12
- c 24
- d 60

- 21** A diagonal of a parallelogram is drawn forming 2 triangles. If the area of one of the triangles is 34 cm^2 , what is the area of the parallelogram?

- a 17 cm^2
- b 34 cm^2
- c 68 cm^2
- d 136 cm^2

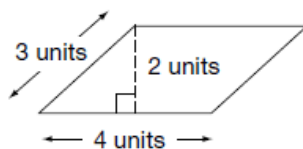
- 34** Which expression can be used to find the area of the shaded region?



- a $54 \div 2 - 12$
- b $54 - 4 \times 12 \div 2$
- c $12 \div 2 - 54$
- d $12 - 54 \div 2$

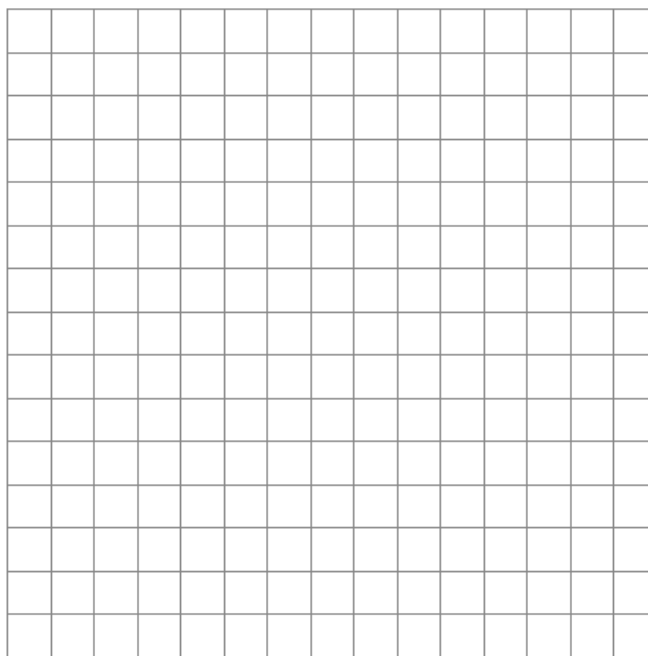
GRADE SIX EQAO QUESTIONS: Measurement

- 10** Determine the area of the parallelogram below.



The area of the parallelogram is _____.

Draw a triangle and a rectangle each with the same area as the parallelogram. Use the grid below.



Justify your answers.

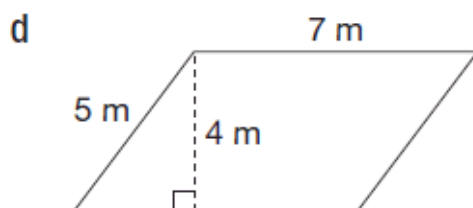
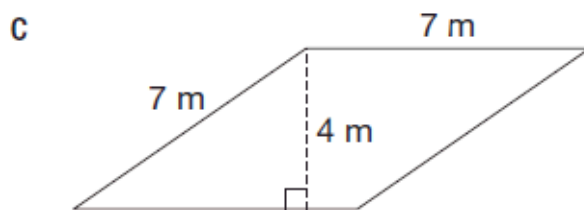
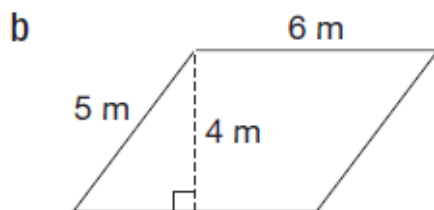
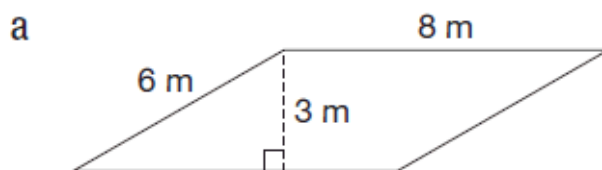
GRADE SIX EQAO QUESTIONS: Measurement

Spring 2010

- 3** Enrico pours 80 L of water into 200 mL cups. If he fills the cups completely, how many cups does he fill?

a 250
b 400
c 2500
d 4000

- 4** Which parallelogram has an area of 24 m^2 and a perimeter of 28 m?



GRADE SIX EQAO QUESTIONS: Measurement

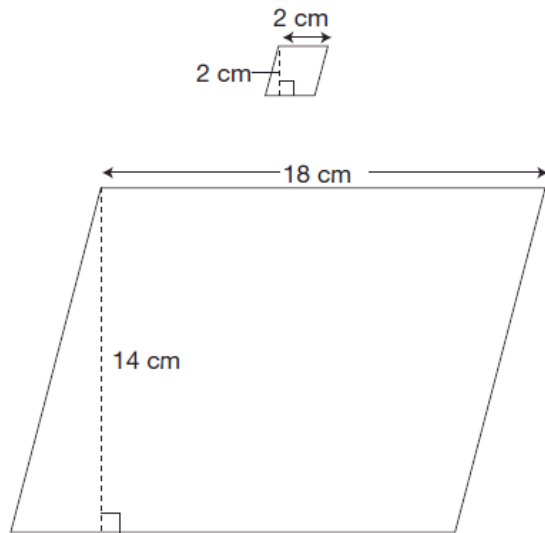
19 Which unit of measure is most appropriate to describe the length of a page in a textbook?

- a centimetre
- b kilometre
- c metre
- d millimetre

21 Which is equivalent to 1 m^2 ?

- a 10 cm^2
- b 100 cm^2
- c 1000 cm^2
- d $10\,000 \text{ cm}^2$

22 Look at the two parallelograms below.



What is the minimum number of small parallelograms needed to cover the larger parallelogram completely?

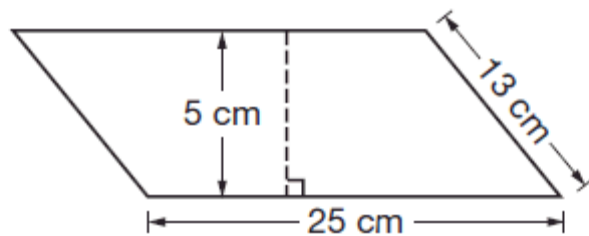
- a 16
- b 63
- c 126
- d 252

GRADE SIX EQAO QUESTIONS: Measurement

24 A turkey weighs 9.75 kilograms. It takes about 20 minutes to cook 500 grams of this turkey. Approximately how many minutes does it take to cook the whole turkey?

- a 39
- b 74
- c 390
- d 488

33 Look at the parallelogram below.



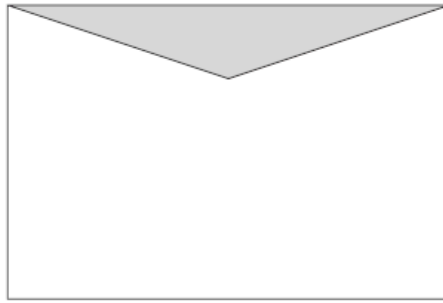
Dylan wants to split the parallelogram into two congruent triangles.

Which expression can he use to find the area, in square centimetres, of each triangle?

- a $(25 \times 5) \div 2$
- b $(25 \times 5) \times 2$
- c $(25 \times 13) \div 2$
- d $(25 \times 13) \times 2$

GRADE SIX EQAO QUESTIONS: Measurement

10 Determine the area of the unshaded part of the rectangle below. Use a ruler.



Justify your answer.

The area of the unshaded part of the rectangle is _____.